



**August 2005**

Published by the Community Relations Office  
Building 130, P.O. Box 5000  
Upton, NY 11973  
Phone: (631) 344-5658 Fax: (631) 344-3654  
[www.bnl.gov](http://www.bnl.gov)

## **NASA-Sponsored Space Radiobiology Research at Brookhaven Lab Yielding Answers to Health-Effects Questions While Educating Students**

*BNL Booster Accelerator Is Best in the U.S. For Simulating Cosmic Rays Found in Space*

- When, on July 26th, the Space Shuttle *Discovery* lifted off from the Kennedy Space Center, the National Aeronautics and Space Administration (NASA) returned to flight for the first time following the disaster that claimed the *Columbia* and her crew on February 1, 2003. With proposed missions to the Moon and Mars, NASA's astronauts will be spending more time in space. So the agency is working with Brookhaven Lab and others here on Earth to learn about the possible risks to human beings who are exposed to space radiation.
- At Brookhaven, this research has been conducted since 1995 using proton and ion beams that simulate the cosmic rays found in space. In 2003, this research got a boost with the opening of a \$34-million facility — called the NASA Space Radiation Laboratory (NSRL) — based at BNL's Booster, which is now the best accelerator in America for radiobiology research.
- Among the results from this research are the recent findings by a Brookhaven biophysicist and his Japanese colleagues published in the *Proceedings of the National Academy of Sciences*. Based on studies of fish, they found that male astronauts who are exposed to cosmic rays in space may suffer temporary sterility, but they are not likely to pass on any possible mutations caused by those rays.
- NSRL is not only a laboratory away from home for over 75 visiting experimenters from over 20 institutions in the U.S. and three other countries, but it also is offering an unique, interdisciplinary educational experience to some 15 graduate students and post-doctoral fellows in the physical and biological sciences. They are participating in the annual NASA Summer Student Program at Brookhaven Lab, which is an intensive, three-week residential program now in its second year.



Students and faculty of the NASA Space Radiation Laboratory's summer school at Brookhaven Lab

(over)

## Final Sizzling Science-Fun Sunday of 2005 to Take Place on August 21st

If you were not among the thousands of community members who have come to the Lab site on a Summer Sunday in 2005 so far, then do not despair — there is one more Summer Sunday during which to experience Brookhaven Lab's high-tech world of big science machines and cutting-edge research:

### Sunday, August 21<sup>st</sup>: RHIC the Relativistic Raceway

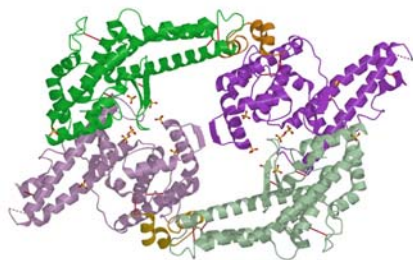
- Discover RHIC — the Relativistic Heavy Ion Collider — where gold ions are collided in bang 'em up collisions near the speed of light!
- Visit the subterranean magnet tunnel and the two colossal particle detectors the size of a house! Learn for your self about the state of matter that this giant atom-smasher just uncovered and what it says about the Big Bang birth of the universe!



No reservations required! Arrive between 10 a.m. and 3 p.m. at Brookhaven Lab, LIE exit 68, north 1-1/2 miles on County Route 46. Ages 16 and over, bring photo ID. For more information, go to [www.bnl.gov](http://www.bnl.gov) or call (631) 344-BNL1.

## Mechanism for Malaria Infection Reveal at Brookhaven Lab's Light Source

*Knowledge of Key Parasite Protein May Now Lead to Development of New Anti-Malarial Drugs and Vaccine*



X-rays from the National Synchrotron Light Source were used to determine the molecular structure of a protein, which allows the malaria parasite to invade the red blood cell. (Image courtesy of the Cold Spring Harbor Laboratory)

- Around the world, an estimated 2.7 million people die of malaria each year, with some 75 percent of those being children. Although the disease is nowadays imported to the U.S. from other countries, more than one thousand people within this country come down with the disease each year.
- The disease is caused by mosquito-borne *Plasmodium* parasites. It is transmitted when a female mosquito carrying the parasite takes a blood meal needed for egg production. In biting her victim, the mosquito injects the parasite into a victim's bloodstream, from which they migrate first to the liver. Successive generations invade the victim's red blood cells, thus destroying them.
- The molecular structure of a protein that enables malaria parasites to invade red blood cells was recently discovered at the National Synchrotron Light Source at Brookhaven by researchers from Cold Spring Harbor Laboratory, which is also on Long Island. As reported in the July 29 issue of the journal *Cell*, this discovery could help other researchers design better anti-malarial drugs and develop a malaria vaccine.